AMENDMENTS TO THE CLAIMS

Following is a listing of all claims in the present application, which listing supersedes all previously presented claims:

Listing of Claims:

1. (Currently Amended) A method of evaluating human stress using photoplethysmography (PPG), comprising:

defining at least one PPG parameter;

radiating light having at least one wavelength, which reacts to a blood component to be measured, at a measuring target and measuring a PPG signal from the measuring target during a predetermined period of time; ~~and~~

evaluating a level of human stress using a plurality of stress indexes obtained from the PPG parameter; and

displaying the plurality of stress indexes and the evaluated level of human stress obtained during evaluating the level of human stress.

2. (Original) The method as claimed in claim 1, wherein the at least one PPG parameter is selected from the group consisting of a pulse component amplitude, a peak-to-peak interval, and a baseline spread range.

3. (Original) The method as claimed in claim 2, wherein evaluating the level of human stress comprises using one of a long-term test and a short-term test.

4. (Original) The method as claimed in claim 2, wherein evaluating the level of human stress comprises:

obtaining an average of pulse component amplitudes during a predetermined period of time;

comparing a baseline spread range with the average of pulse component amplitudes during the predetermined period of time; and

calculating a relative stress index based on a relationship between the baseline spread range and the average of pulse component amplitudes.

5. (Original) The method as claimed in claim 3, wherein evaluating the level of human stress in the short-term test comprises:

obtaining an average of peak-to-peak intervals during a predetermined period of time;

counting a number of peak-to-peak intervals less than the average peak-to-peak interval and a number of peak-to-peak intervals greater than the average peak-to-peak interval, during the predetermined period of time; and

calculating a relative stress index based on a relationship between the number of peak-to-peak intervals less than the average peak-to-peak interval and the number of peak-to-peak intervals greater than the average peak-to-peak interval.

6. (Original) The method as claimed in claim 3, wherein evaluating the human stress in the long-term test comprises:

obtaining peak-to-peak intervals with respect to all pulses during a predetermined period of time;

defining a plurality of data groups composed of a predetermined number of peak-to-peak intervals with respect to all of the peak-to-peak intervals obtained during the predetermined period of time;

performing a predetermined statistical method according to a number of the plurality of data groups; and

calculating a stress index based on a p-value detected as a result of performing the predetermined statistical method.

7. (Original) The method as claimed in claim 3, wherein evaluating the level of human stress in the short-term test comprises:

obtaining an average of pulse component amplitudes during a predetermined period of time;

counting a number of pulse components having an amplitude less than the average of pulse component amplitudes and a number of pulse components having an amplitude greater than the average of pulse component amplitudes, during the predetermined period of time; and

calculating a relative stress index based on a relationship between the number of pulse components having an amplitude less than the average of pulse component amplitudes and the number of pulse components having an amplitude greater than the average of pulse component amplitudes.

8. (Original) The method as claimed in claim 3, wherein evaluating the level of human stress in the long-term test comprises:

obtaining pulse component amplitudes with respect to all pulses during a predetermined period of time;

defining a plurality of data groups composed of a predetermined number of pulse component amplitudes with respect to all of the pulse component amplitudes obtained during the predetermined period of time;

performing a predetermined statistical method according to a number of the plurality of data groups; and

calculating a stress index based on a p-value detected as a result of performing the predetermined statistical method.

9. (Original) The method as claimed in claim 6, wherein the predetermined statistical method is a two-sample paired t-test when the number of the plurality of data groups is two and is one-way ANalysis Of VAriance (ANOVA) when the number of the plurality of data groups is three or more.

10. (Original) The method as claimed in claim 8, wherein the predetermined statistical method is a two-sample paired t-test when the number of the plurality of data groups is two and is one-way ANalysis Of VAriance (ANOVA) when the number of the plurality of data groups is three or more.

11. (Original) The method as claimed in claim 1, wherein evaluating the level of human stress comprises:

obtaining an average of pulse component amplitudes and an average peak-to-peak interval during a predetermined period of time;

comparing a baseline spread range with the average of pulse component amplitudes during the predetermined period of time;

calculating a relative first stress index based on a relationship between the baseline spread range and the average of pulse component amplitudes;

counting a total number of peak-to-peak intervals, a number of peak-to-peak intervals less than the average peak-to-peak interval, and a number of peak-to-peak intervals greater than the average peak-to-peak interval, during the predetermined period of time; and

calculating a relative second stress index based on a relationship between the number of peak-to-peak intervals less than the average peak-to-peak interval and the number of peak-to-peak intervals greater than the average peak-to-peak interval.

12. (Original) The method as claimed in claim 11, wherein evaluating the level of human stress further comprises:

counting a total number of pulse components, a number of pulse components having an amplitude less than the average of pulse component amplitudes, and a number of pulse components having an amplitude greater than the average of pulse component amplitudes, during the predetermined period of time; and

calculating a relative third stress index based on a relationship between the number of pulse components having an amplitude less than the average of pulse component amplitudes and the number of pulse components having an amplitude greater than the average of pulse component amplitudes.

13. (Original) The method as claimed in claim 1, further comprising:

averaging the plurality of stress indexes acquired using at least one PPG parameter; and

determining an average stress index as a final stress index.

14. (Original) The method as claimed in claim 1, further comprising:

performing low-pass filtering to remove high-frequency noise from the measured PPG signal, before evaluating the level of human stress.

15. (Cancelled).

16. (Original) A computer-readable recording medium comprising:

a first program for defining photoplethysmography (PPG) parameters including at least one of a pulse component amplitude, a peak-to-peak interval, and a baseline spread range recorded on the medium;

a second program for radiating light having at least one wavelength, which reacts to a blood component to be measured, at a measuring target and measuring a PPG signal from the measuring target for a predetermined period of time recorded on the medium; and

a third program for evaluating a level of human stress based on the PPG parameters defined by the first program, in one of a long-term test and a short-term test, which are identified depending on a measuring time of the PPG signal, recorded on the medium.

17. (Currently Amended) An apparatus for evaluating human stress using photoplethysmography (PPG), comprising:

a PPG measuring unit, which radiates light having at least one wavelength, which reacts to a blood component to be measured, at a measuring target and measures a PPG signal from the measuring target during a predetermined period of time;

an amplifying and filtering unit, which amplifies the PPG signal provided from the PPG measuring unit to a predetermined level and performs filtering to remove noise components; ~~and~~

a signal processing unit, which defines at least one PPG parameter and evaluates a level of human stress using a plurality of stress indexes acquired using the PPG parameter; and

a display unit configured to display the level of human stress evaluated by the signal processing unit.

18. (Original) The apparatus as claimed in claim 17, wherein the PPG parameter is at least one selected from the group consisting of a pulse component amplitude, a peak-to-peak interval, and a baseline spread range.

19. (Original) The apparatus as claimed in claim 17, wherein the level of human stress is acquired from one of a long-term test and a short-term test, which are identified depending on a measuring time of the PPG signal provided from the amplifying and filtering unit.

20. (Original) The apparatus as claimed in claim 17, wherein the PPG measuring unit has a block letter "C" shape so that the measuring target can be inserted into the PPG measuring unit, and has a transmissive or a reflective structure.

21. (Original) The apparatus as claimed in claim 17, wherein the signal processing unit comprises:

a first function of obtaining an average of pulse component amplitudes and an average peak-to-peak interval during the predetermined period of time;

a second function of comparing a baseline spread range with the average of pulse component amplitudes during the predetermined period of time; and

a third function of calculating a relative first stress index based on a relationship between the baseline spread range and the average of pulse component amplitudes.

22. (Original) The apparatus as claimed in claim 21, wherein the signal processing unit further comprises:

a fourth function of counting a total number of peak-to-peak intervals, a number of peak-to-peak intervals less than the average peak-to-peak interval, and a number of peak-to-peak intervals greater than the average peak-to-peak interval, during the predetermined period of time; and

a fifth function of calculating a relative second stress index based on a relationship between the number of peak-to-peak intervals less than the average peak-to-peak interval and the number of peak-to-peak intervals greater than the average peak-to-peak interval.

23. (Original) The apparatus as claimed in claim 21, wherein the signal processing unit further comprises:

a sixth function of counting a total number of pulse components, a number of pulse components having an amplitude less than the average of pulse component amplitudes, and a number of pulse components having an amplitude greater than the average of pulse component amplitudes, during the predetermined period of time; and

a seventh function of calculating a relative third stress index based on a relationship between the number of pulse components having an amplitude less than the average of pulse component amplitudes and the number of pulse components having an amplitude greater than the average of pulse component amplitudes.

24. (Original) The apparatus as claimed in claim 21, wherein the signal processing unit further comprises:

an eighth function of averaging the plurality of stress indexes acquired from one of the long- and short-term tests based on the PPG parameters and determining an average stress index as a final stress index.